

**Notice of Allowability**

Application No.

10/675,170

Examiner

Shawn Gu

Applicant(s)

LUICK, DAVID ARNOLD

Art Unit

2189

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the amendment filed on 27 March 2006.
2. ☒ The allowed claim(s) is/are 1-21.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some\* c) ☐ None of the:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.  
**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.  
(a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached  
1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.  
(b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

- |   |  |
|---|--|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892)  | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)                                  |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                | 6. <input checked="" type="checkbox"/> Interview Summary (PTO-413),<br>Paper No./Mail Date <u>04042006</u> . |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),<br>Paper No./Mail Date _____ | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment  |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit<br>of Biological Material          | 8. <input type="checkbox"/> Examiner's Statement of Reasons for Allowance                                    |
|   | 9. <input type="checkbox"/> Other _____.   |

### EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Roy Truelson (reg #: 34265) on 5 April 2006.

2. Claim 1 has been amended as follows:

1. (Currently Amended) A digital data processing device, comprising:

a memory divisible into a plurality of pages, said memory containing a segment table and a page table separate from said segment table, said segment table having a plurality of segment table entries corresponding to respective segments in a first address space, each said segment containing a respective integral number of said pages of said memory, wherein, for at least some said segments, the respective integral number is greater than one, each segment table entry containing pre-fetch data identifying a plurality of sub-units of the corresponding segment as pre-fetch candidates, each said sub-unit of the corresponding segment being an integral number of said pages;

at least one processor;

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at least one structure for temporarily storing data from said memory in a location more accessible to said processor than said memory is accessible to said processor;  
and

a pre-fetch engine, said pre-fetch engine performing at least one pre-fetch action, said at least one pre-fetch action comprising pre-fetching selective data with respect to a sub-unit of said plurality of sub-units of a segment from said memory into said at least one structure for temporarily storing data, said pre-fetch engine selecting said selective data for pre-fetching using said pre-fetch data in said segment table.

### **STATEMENT OF REASONS FOR ALLOWANCE**

3. The following is an examiner's statement of reasons for allowance:

As for claims 1 and 12, the combined references of Doing et al. [6,161,166], Kedem et al. [6,134,643], Schumann et al. [6,012,106] and Tanenbaum, already disclosed most of the claim as described in the first Office Action, and Doing further teaches that "each said segment containing a respective integral number of said pages of said memory, wherein, for at least some said segments, the respective integral number is greater than one" and "a page table separate from said segment table" (Fig 8). However, the sub-units identified as pre-fetch candidates by Schumann et al. are cachelines, not memory pages. Therefore, the combined references fail to teach identifying a plurality of sub-units of a segment as pre-fetch candidates, wherein each of the sub-unit is an integral number of memory pages.

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As for claim 14, the combined references of Doing et al., Kedem et al., Schumann et al. and Tanenbaum teach every limitation of the claim as described in claim 12 of the first Office Action, but the counter disclosed by Kedem is only an up-counter instead of an up-or-down counter (Kedem, Fig 2, Item 55), and there is no second type of event to trigger the decrement of the counter.

As for claim 19, the claim is allowed for the same reason described above for claims 1 and 12. For the record, Schumann teaches that the pre-fetch is performed with respect to each sub-unit/(an integral number of pages) associated with a segment (by setting the value for Prefetch Length to the total number of cachelines in the corresponding page, see column 4, lines 18-22 and lines 55-63).

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

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### Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shawn Gu whose telephone number is (571) 272-0703.

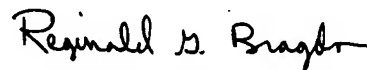
The examiner can normally be reached on 9am-5pm, Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Reginald Bragdon can be reached on (571) 272-4204. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Shawn X Gu  
Patent Examiner  
Art Unit 2189



REGINALD G. BRAGDON  
PRIMARY EXAMINER

5 April 2006